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10/585,857	07/12/2006	Masaki Suzuki	00862.109524.	7759

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FITZPATRICK CELLA HARPER & SCINTO
1290 Avenue of the Americas
NEW YORK, NY 10104-3800

EXAMINER	
LIU, LI	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,857	SUZUKI ET AL.	
	Examiner	Art Unit	
	LI LIU	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-9,11-15 and 17-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-9,11-15 and 17-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/06/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment received on 12/31/2009 has been entered and made of record.

2. In view of the amendment to the claims, the cancellation of claims 3, 10, 16, and 20, amendment to claims 1, 2, 4-9, 11, 12, 14, 15, and 17-19 are acknowledged.

Claims 1, 2, 4-9, 11-15, and 17-19 are now pending.

3. Previous objection to drawings, rejection of claims 1-16 on 35 U.S.C. 112 second paragraph, rejection of claims 8, 9, 14, 15, 18, and 19 on 35 U.S.C. 101 have been overcome in view of applicant's amendments/remarks and are hereby withdrawn.

Response to Arguments/Remarks

4. Applicant's arguments filed on 12/31/2009 with respect to claim 1 and 11 have been considered but are moot in view of the new ground(s) of rejection herein below, necessitated by the amendment. To the extent that the current arguments apply, each will be addressed below

Applicant argues on page 19-20 that both Fukunage (US 6169821 B1) and Tong (US 5982435) fail to teach or suggest "**predicted data of a block image obtained by segmenting image data of an input frame into a plurality of blocks is extracted from a previous frame**", or "**data modified by the predicted data is output, if a first mode is selected, and that data unmodified by the predicted data is output, if a second mode is selected**".

The Examiner respectfully disagrees. As correctly noted by Applicant, Fukunaga discusses methods employing both intra-frame coding (I-frame, corresponding to the second coding mode of the instant application) and inter-frame coding (P-frame, corresponding to the first coding mode of the instant application). Intra-frame coding (2nd mode), by definition, are performed relative to information that is contained only within the current frame, and not relative to any other frame in the video sequence. Therefore, intra-frame coding is unmodified by predicted data. Inter-frame coding, on the other hand, is expressed in terms of one or more neighboring frames. The "inter" part of the term refers to the use of inter frame prediction. In addition, as is well known in the video/image coding field and also mentioned by both Fukunage (col. 9, lines 34-37) and Tong (Fig. 8), inter/intra coded frames will firstly be divided into blocks known as macroblocks. Therefore, Fukunaga indeed teach and suggest "*predicted data of a block image obtained by segmenting image data of an input frame into a plurality of blocks is extracted from a previous frame*", AND "*data modified by the predicted data is output, if a first mode is selected, and that data unmodified by the predicted data is output, if a second mode is selected*"

As stated in the last Office Action dated 09/02/2009, the Tong reference is only brought in to show more details of a general inter-frame coding process that includes detecting a motion vector from an input image, deriving a difference between the input image signal and a predicted image signal (Tong, Fig. 7).

In view of this reasonable interpretation of the claims and the prior art, the Examiner respectfully submits that the new rejections set forth below are proper.

Information Disclosure Statement

5. The information disclosure statement (IDS) submitted on 11/06/2009 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information referred to therein has been considered by the examiner.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 2, 4-6, 8, 9, 11-15, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukunaga et al. (hereafter referred to as "Fukunaga", US 6169821, IDS), in view of Tong et al. (hereafter referred to as "Tong", US 5982435, IDS), and further in view of Kishi (US 2002/0031182, IDS).

Regarding claim 1, Fukunaga discloses a moving image coding apparatus that sequentially inputs and codes image data of frames constituting a moving image (**Fukunaga, Fig. 1**), the apparatus comprising:

a mode selection unit that adaptively selects, for each frame, either a first coding mode using inter-frame correlation or a second coding mode of coding a frame separately (**Fukunaga, Fig. 1, numeral 306 is the Intra/Inter decision unit**);

a storage unit that stores a frame image (**Fukunaga, Fig. 1, reference frame memory unit 305**);

a segmentation unit that segments image data of an input frame into a plurality of blocks (**Fukunaga, col. 9, lines 34-40**);

a decoding unit that locally decodes coded image data in accordance with an output from said mode selection means (**Fukunaga, Fig. 1, output from Intra/Inter decision unit 306 feeds to decoding unit 303**);

a computation unit that (i) extracts, from a previous frame that has been locally decoded and stored in said storage unit by said decoding unit, predicted data of a block image (**Fukunaga, Fig. 21 and col. 1, lines 30-44, the inter-frame or P-frame coding are predicted from the preceding frames**) obtained by segmentation by said segmentation unit and outputs a block obtained by subtracting the predicted data from the segmented block image, if the mode selected by said mode selection unit is the first coding mode (**prediction and coding of difference signal only applies to inter-frame coding, see more details below referring to the Tong reference**), or (ii) outputs the block segmented by said segmentation unit, if the mode selected by said mode selection unit is the second coding mode (**Fukunaga, Fig. 21 and col. 1, lines 30-44, the intra-frame or I-frame coding, by definition, are performed relative to information that is contained only within the current frame, and not relative to any other frame in the video sequence**);

Fukunaga does not expressly disclose the computation details of subtracting the predicted data from the block. Fukunaga does not disclose rounding down coded data from a least significant bit to adjust an amount of code data.

In the same field of endeavor, Tong discloses an image coding apparatus which performs discrete wavelet transform (DWT) to blocks obtained by subtracting the predicted data from the block image data (**Tong, Fig, 7**), and Kishi discloses an image coding device that encodes the spatial frequency component data (**Kishi, Fig. 1C, Discrete Wavelet Transformation unit 110**) for each bitplane to generate code data for each bitplan (**Kishi, Fig. 10**), adjusts a code data amount by discarding code data corresponding to bitplanes from a least significant bit position to a predetermined bit position (**Kishi, Figs. 10 and 15, bitplanes are deleted in ascending order, and the number of bitplanes to be deleted is determined by comparing code length of coded data A, with a threshold, referred to as "designated code length B"**), and outputs remaining code data as the code data of the segmented block (**Kishi, Fig. 12**).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Tong and Kishi with that of Fukunaga to yield the invention as described in claim 1, because both coding an inter-frame with reference to a preceding I-frame, and bitplane round down to adjust the amount of coded data are well-known in the art, the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 2, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 1, wherein said decoding unit locally decodes only image data coded in the second coding mode (**Fukunaga, Fig. 1, unit 303 decodes only intra-frame to be used as reference frame**).

Regarding claim 4, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 1, wherein said transformation unit performs discrete wavelet transformation (**Tong, Fig. 7, unit 114, or Kishi, Fig. 1C, unit 110**).

Regarding claim 5, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 1, further comprising an instruction unit that instructs whether to discard code data of bitplanes by said adjusting unit (**Kishi, Fig. 15, Steps 1505 and 1506**).

Regarding claim 6, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 1, wherein said mode selection unit selects the second coding mode for a frame which is input for the first time after a number of input frames becomes a predetermined number (**Fukunaga, col. 5, lines 19-24, "...intra-frame coding is selected at regular intervals (once every thirty frames, for example)..."**).

Regarding claims 8 and 9, the limitations of the claims are rejected for the same reasons as set forth in the rejection of claim 1 above.

Regarding claim 11, it is analyzed in the same way as claim 1. Fukunaga discloses updating said storage unit with image data obtained by locally decoding code data when the second coding mode is selected (**Fukunaga, Fig. 1, units 305 and 309**).

Regarding claim 12, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 11, wherein said coding unit outputs code data C(Nmax), C(Nmax-1), . . . , C(Nmax-k) as effective code data up to a maximum value k satisfying $\sum L(C(N_{\max}-k)) \le T$ where Nmax is a bit position of a most significant bitplane, C(i) is code data of nth bitplane, L(C(i)) is a code data amount, and T is a threshold representing an allowable code amount of one frame, and discards code data C(0), . . . , C(Nmax-k-1) (**Fukunaga, Figs. 10 and 15, bitplanes are deleted in ascending order, and the number of bitplanes to be deleted (k) is determined by comparing code length of coded data, i.e.** $\sum L(C(N_{\max}-k))$**, referred to as A in the Kishi reference, with a threshold T, T is referred to as "designated code length B" in the Kishi reference**).

Regarding claim 13, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 12. The Fukunaga, Tong, and Kishi combination does not expressly teach wherein the threshold T differs in the first coding mode and the second

coding mode. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use different threshold values for Inter-frame coding (first coding mode) and intra-frame coding (second coding mode), because an intra-frame coding codes a frame separately and also serves as the reference for the following inter-frames, while inter-frame coding codes only the differences between a frame and a preceding frame (Fukunaga, col. 1, lines 16-28).

Regarding claims 14 and 15, the limitations of the claims are rejected for the same reasons as set forth in the rejection of claim 11 above.

Regarding claims 17-19, they are rejected as being the de-coding claims corresponding to the encoding claim 11, since it has been held that a mere reversal of the encoding process to reconstruct the original signal involves only routine skill in the art.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukunaga (US 6169821), in view of Tong (US 5982435) and Kishi (US 2002/0031182), and further in view of Islam et al. (hereafter referred to as "Islam", US 6697521).

Regarding claim 7, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 1. Kishi does not however expressly disclose using bit-shifting to delete the selected number of lower bitplanes. However, discarding lower

bitplane data by bit-shifting is well known and expected in the art, as for example taught by Islam (Islam, Fig. 2a). It would have been obvious to one of ordinary skill in the art at the time of the invention to delete lower bitplane data by bit-shifting, because it is one of the most popular ways of removing data in computing, the other choice would be replacing the bits with zeros.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-5363. The

examiner can normally be reached on Monday-Thursday, 7:00AM-4:30PM, ALT. Fridays, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed, can be reached on (571)272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

L.L.

/Samir A. Ahmed/

Supervisory Patent Examiner, Art Unit 2624